darTZeel

NHB-18NS preamplifier

User Manual

(Pre-release)

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darTZeel NHB-18NS

User Manual

1. Introduction

Congratulations for purchasing a darTZeel NHB-18NS.

Our machines are designed and hand built for *very* long lasting use and musical pleasure.

The darTZeel NHB-18NS is a highly unusual preamplifier, and requires special care. We strongly recommend you read this manual in its entirety, in order not to miss *any* reason for enjoying your machine at its very best!

In order to facilitate packing/unpacking operation, please go to our web site www.darTZeel.com and download our full pictured packaging instruction.

2. Brief description

The darTZeel NHB-18NS is the perfect partner of the NHB-108 model one.

The in-house designed, built-in phono stage, is offered as a standard feature.

One of the secrets of the darTZeel NHB-18NS can be found in two words:

Passion and Love… The passion for sound, of course, and love of music, needless to say…

As for the rest, we just put in few electronics, a wee bit of mechanics, and a touch of appropriate software.

The NHB-18NS is a full battery powered machine. Two different operation modes can be chosen:

1. Automatic mode:

   Every time you will switch your preamplifier ON, battery operation mode will be selected, no matter if the batteries are fully charged or not. In case batteries would need a charge, or when the NHB-18NS is switched off, the external supply will charge them automatically. When batteries are fully charged, you can expect for a battery life of about 12 hours.

2. BTM (AC mode):

   In this mode, batteries will be constantly kept fully charged. A built-in overcharge protection allows for using this mode permanently, ensuring you will benefit of a full charge when you will perform some critical listening session.

More detail about these two modes are described later (**Chapter 3.5 Special features**).

As for the embarked technology, the NHB-18NS is truly at the peak that is possible to realise today.

With more than 1,200 electronic parts involved, we however kept our very first aims untouched. The signal path only travels through 7 junctions (7 transistors) from input to output, while the phono stage only adds 6 junctions for the sake of best transparency.

All basic circuits – phono stage included – are directly derived from the internationally patented NHB-108 model one amplifier's. No global feedback, open loop output stages, very wide bandwidth and extremely low phase shift: this *is* the NHB-18NS.

Our proprietary volume control involves a very new approach, never achieved before: no any contacts, relays, switches or silicon devices are used. The delicate sound then remains untouched, for your greatest pleasure, so the reason why we did not write "Volume" on the front plate, but simply Pleasure Control… The way we do it is still a bit confidential at the moment; we just can say that some light is involved in the control.

The Enjoyment Source – commonly called "input selector" – also benefits from the very same kind of approach: we do not select the input, we do *enable* it. Here again, no switch, relay or the like.

NS stands for No Switch. We are very proud that the NHB-18NS is the very first "zero contact" preamplifier in the world. So we are even prouder you can enjoy it right now.

This present user manual is still under its preliminary state, so please excuse us for some missing detailed explanations and less than perfect presentation…

3. The NHB-18NS in details

3.1. FRONT PANEL

1. Power Nose
2. Enjoyment Source
3. Pleasure Control
4. Balance Control
5. Mute / HT Bypass
6. Mono-Stereo / Dimmer
7. Identity Plate

3.2. REAR PANEL

1. Phono Input
2. Line RCA / Zeel Input
3. Line RCA / Zeel Inputs
4. Line XLR Input
5. Line XLR Output
6. Line RCA Output
7. Line darT Outputs
8. Line RCA Fixed Output
9. Power Supply / Trigger Outputs

3.3. Connecting the NHB-18NS

First connect the external power supply's umbilical cord to the power connector located on the **Rear Panel (Chapter 3.2. fig 9)**.
Then connect the AC cord into your wall socket.

Phono input:
Use inputs I **(Chapter 3.2. pos. 1)**. You can either connect the ground wire to left or right channel. The toggle switch allows choosing phono ground path between signal ground, AC earth, or floating. Default position is Gnd (right). If you hear some abnormal rumble, you can play with both channels' toggles in order to minimize it.
Phono settings: You can change the phono input settings by a wide margin, allowing for most MM and MC cartridges. This can be done using a solder iron. This will be explained in details in the final manual release. Factory settings are:
MC, gain = 60 dB, load = 836 ohms
This setting works well for most audiophile cartridges with an output level from 0.3 to 1 mV.

Line inputs:
Inputs II to V **(Chapter 3.2. pos. 2 & 3)** are for RCA single ended sources, input VI is for XLR true balanced sources.

Toggle switches:

For inputs II to V, default position is center. Left position provides 6 dB of attenuation in the case your source would exhibit a very high output level. Right position is for Zeel 50-ohm purpose, dedicated to future darTZeel sources.

For input VI **(Chapter 3.2. pos. 4)**, the upper toggle default position is center. Right position offers 600-ohm input impedance for professional gear. Left position lowers the gain by 6 dB; this attenuation only works when true floating source is used (transformer output source).
Lower toggle switch allows for various ground path schemes regarding the XLR chassis jack. Default position is right. Center position is floating, useful in certain circumstances for cancelling ground loops. Left position is with XLR chassis connected to ground via a 100-ohm resistor, for same purpose as described for center position.

Outputs:

Nothing particular to notice here, save the following:

REC output **(Chapter 3.2. pos. 8)** is a fixed, buffered output. Loading it with a matching component like a recorder or a CD burner will therefore not affect the sound quality. Due to non use of any global negative feedback, the output gain is slightly lower than 0 dB.

BNC darT outputs **(Chapter 3.2. pos. 7)**: All these 3 output are separately buffered, and are dedicated for feeding the darTZeel NHB-108 model one power amplifier. Optional, built-in filters can be activated for bi-amping or tri-amping purpose.
This special feature will be explained in details in the final manual release.

3.4. Using the NHB-18NS

Once everything has been properly connected, you can power the preamplifier ON by pressing the Power Nose **(Chapter 3.1. pos. 1)**.
After about 10 seconds, the NHB-18NS is ready to play music.
When "enjoying" from a line source to another one, about half a second dead-time is allowed for blocking bumps and clicks.
When "enjoying" from line to phono, a very small click can be heard (independent of pleasure control position), then the phono stage is activated after around 8 seconds.
When going back from phono to line, only half a second is required.

Balance control **(Chapter 3.1. pos. 4)**:

This is not a standard balance control (of course, it is a darTZeel machine)!
When using the Balance, the change only begins after about plus and minus 5 degrees of rotation, ensuring that when you are close to middle position, balance channel is kept dead center.
At full right position, R channel is increased by 3.5 dB, L channel lowered by 3.5 dB.
At full Left position, L channel is increased by 3.5 dB, R channel lowered by 3.5 dB.
This feature allows for very fine adjustment, and keeps global loudness at same level even while altering the balance control from central position.

3.5. Special features

Home Theater Bypass:

If you hold the mute toggle switch **(Chapter 3.1. pos. 5)** for about 7 seconds, the Mute LED will go green, indicating that the corresponding input is now in HT bypass mode. The pleasure control is now defeated, and the global In-to-Out gain is set at 0 dB. The setting will be kept in memory until the Mute toggle will be hold again for 7 seconds.
Each input can be HT bypassed separately if needed.

Front panel Illumination

You can switch off - or back on - all light illumination (LEDs and knobs surrounding) by either doing the followings:

Holding down the Mono/Stereo toggle switch **(Chapter 3.1. pos. 6)** for 3 seconds.

OR

Pressing, on the remote control, both plus and minus loudness keys for about 2 seconds.

Power supply mode operation

From software version 2.10, it is now possible to choose between two operating modes:

1. BTM (**B**attery **T**hrough **M**ode, or so called AC Mode): batteries are always kept under charge/maintain mode, whatever the NHB-18NS is switched on or off. This new factory default mode allows for extended battery life time and ensures batteries will be fully charged while performing critical listening session. In this mode, power is supplied by the external power supply through internal batteries, exactly like a computer in-line UPS (Uninterruptible Power Supply): AC grunge, while not fully removed, will be well filtered out thanks to batteries' damping action. This mode will also permit the NHB-18NS to operate even if batteries do not hold a charge anymore, allowing for smooth operation until eventual batteries' replacement.
2. Automatic Mode: the NHB-18NS always works on battery mode when powered on, as long as they have enough juice. Batteries are charged/maintained when the machine is switched off. This is the mode you will choose when performing critical listening session, when you will want to be sure there are no any noise and/or RFI coming from AC mains.
   Ultimate sound performance will be given in Automatic Mode.

In case of intensive use, say more than 4-5 hours every day, we strongly recommend switching to BTM for about 2-3 days every month: this will allow for full reconditioning charge and will ensure longest possible life span of batteries.

!!! NEVER, EVER PHYSICALLY REMOVE OR UNPLUG BATTERIES !!!
THE NHB-18NS WILL NOT START UP DOING THIS

Going from BTM to Automatic Mode:

- Press down both "Mono/Stereo" *and* "Mute" switches for 2 seconds.
- Central LED colour status will change from GREEN to ORANGE.

Going from Automatic Mode to BTM:

- Press down both "Mono/Stereo" *and* "Mute" switches for 2 seconds.
- Central LED colour status will change from ORANGE to GREEN.

LED status has been updated too, in order to provide you a better monitoring view of the chosen operation mode. Please read very next chapter, which explains this in detail.

3.6. LED Status

The 3 LEDs inform you about almost everything you would need to know. In order to better understand their behaviour, hereunder is a summary:

Central power LED in BTM:

NHB-18NS powered ON → GREEN = BTM or remote receiving NO LIGHT = mains failure

NHB-18NS Powered OFF → RED = Permanent charge / maintain

NHB-18NS Powered OFF, when an AC mains failure occurred: NO LIGHT

Central power LED in Automatic Mode:

NHB-18NS powered ON → ORANGE = battery mode RED = charging GREEN = remote receiving

NHB-18NS Powered OFF → ORANGE = charging GREEN = 85% charged / maintain

NHB-18NS Powered OFF, when an AC mains failure occurred: NO LIGHT

Mute LED:

NHB-18NS powered ON → ORANGE = normal mode RED = Mute GREEN = HT bypass

NHB-18NS Powered OFF → NO LIGHT

Mono/Stereo LED:

NHB-18NS powered ON → ORANGE = stereo mode RED = mono mode

NHB-18NS Powered OFF → NO LIGHT

3.7. Remote control

Every time you either press plus or minus loudness key(s), all three LEDs are going GREEN until you release the pressure. So you perfectly know when the NHB-18NS receives an order. This feature is very useful when you want to adjust the loudness in very small increments.

Functions:

- Briefly hitting - pulse hit - plus or minus key: Level increases or decreases by 0.5 dB
- Holding plus or minus key: Level change speeds up to 5 dB per second (time dependent speed).
- Pressing both plus and minus key for about 3 seconds: Shuts all NHB-18NS illumination off. Pressing again both keys for 3 seconds will restore illumination.

4. Technical data (subject to change)

darTZeel NHB-18NS preamplifier

Gain	:	Line 11 dB Phono 30 to 66 dB (up to 77dB gain at output)
Frequency response	:	1 Hz to 1 MHz, +0, -6 dB (depends on measurement method). 10 Hz to 100 kHz, +0, -0.5 dB (depends on measurement method). 20 Hz to 40 kHz, ±0.5 dB (XLR inputs and outputs).
Rise time	: <	0.8 µs. (depends on measurement method).
Slew rate	: >	88 V/µs, peak-peak.
Total Harmonic Distortion (THD)	: <	1 % from 7 Hz to 77 kHz
Temporal Distortion	:	None, at any level and load equal or above 50 ohms.
Crosstalk	: <	-90 dB from 20Hz to 20kHz.
Signal to noise ratio	: >	92 dB (A), line; > 70 dB (A), phono w/factory settings.
Consumption	:	7-70 watts, depending on working mode.
Size in mm	:	440 x 335 x 170 (WxDxH). Total deep with handles: 415 mm.
Net weight	:	23 kg, power supply 3 kg, total 26 kg

The darTZeel NHB-18NS is made to last forever by
darTZeel Audio SA in Geneva, Switzerland.

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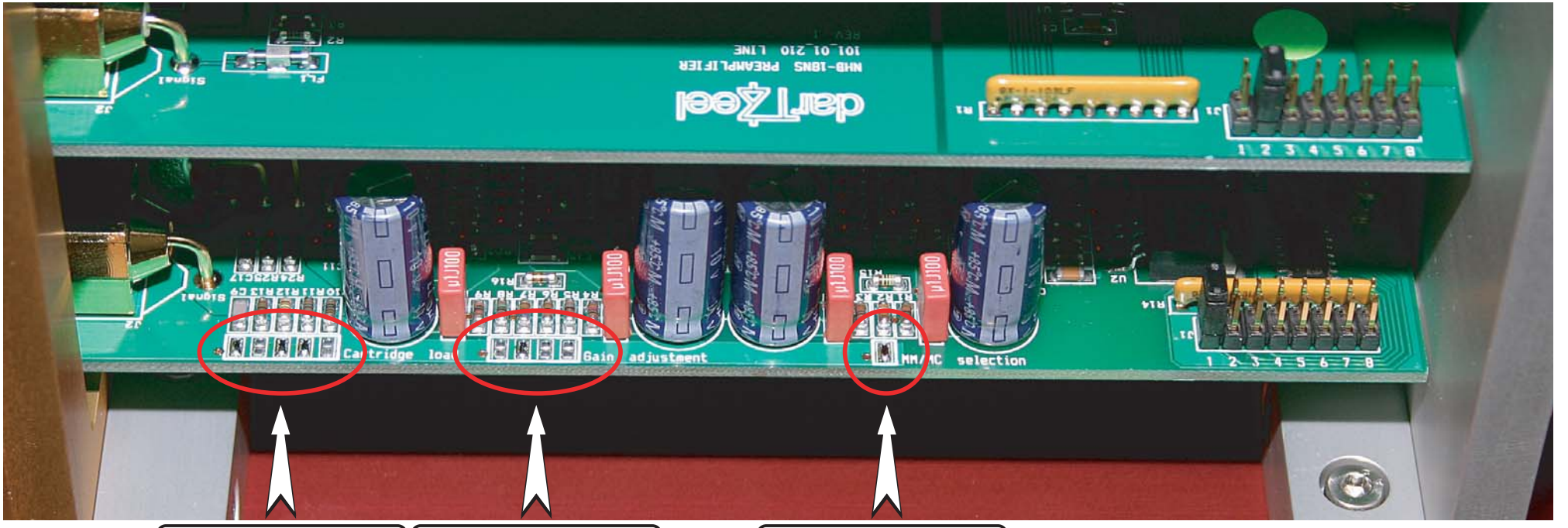

1nF 5k1 1k 510 100

LOAD in Ohms/nF

Unsoldered Pad = 47kΩ

Soldered Pad = Set

For MM, 1nF must be unsoldered !!!

Resistors can be paralleled:
1k and 510 both soldered give 338Ω

54 57 60 63 66
30 33 36 39 42

Unsoldered Pad

GAIN in dB

Soldered Pad = Set

Gain when MC set

Gain when MM set

ONLY ONE SOLDERED PAD AT A TIME

$\overline{\text{MM}}$/MC

Cartridge Type

Soldered = MC

Unsoldered = MM